In the Office action, the examiner objected to the specification and claims due to a number of informalities. These informalities have been addressed using the examiner's suggested amendments for guidance. With regard to the examiner's objection to the term "lead-zirconite-titanite-four," the typographical error found in the original application has been corrected to properly refer to the preferred material as "lead zirconate titanate of the type known as PZT-4." A specification sheet provided by a supplier of PZT-4 is enclosed. Of course, the "P", "Z" and "T" of the term "PZT-4" refer to the lead (chemical abbreviation Pb), zirconium (chemical abbreviation Zr) and titanium (chemical abbreviation Ti) found in lead zirconate titanate. One of ordinary skill in the art would have recognized the typographical error as referring to PZT-4. No new matter is added by this amendment.

As to the substantive issues raised by the Office action, the examiner rejected claims 11-44 under 35 U.S.C. § 112, second paragraph. In particular, claim 11 was rejected due to its use of the term "capture liquid," a term regarded by the examiner as vague and indefinite. Applicants respectfully disagree with the examiner's assertion. The term "capture liquid," while admittedly a term coined by applicants, is clearly defined by the specification. Specifically, in the summary of the invention, at page 4, lines 3-5, a "capture liquid" is defined as a liquid capable of forming an aerosol which will "form a layer of encapsulant over the exposed surfaces of the process area." The summary further defines a "capture liquid" as a liquid able to form a thin film on the hazardous material and coalesce on contact with the surfaces of the area to be treated. (Page 5, lines 4-6, line 2.)

Furthermore, specific examples of the properties and compositions of preferred "capture liquids" can be found throughout the specification. For example, for radioactive dust, a "capture liquid" should be selected that will form a tacky coating over the dust. (Page 9, lines 5-15.) One example is a water-based urethane. (Id.) When treating radioactive dust, neutron poisons may also be added. (Page 9, line 33 - page 10, line 2.) For hazardous materials such as asbestos dust or lead, a "capture liquid" can be selected to form a permanent layer over the dust to render it harmless. (Page 10, lines 3-5.) For chemically reactive particulates, a "capture liquid" can be selected such that the hazardous particulates are neutralized. (Page 10, lines 30-33.) In some instances, a very simple "capture liquid" made of sugar water, can be used to form an aerosol of the desired

properties. (Page 11, lines 8-14.) Since the term "capture liquid" is clearly defined by the specification, it is neither vague nor indefinite, and this basis for rejecting claim 11 should be withdrawn.

The examiner also rejected claims 18, 20, 22, 25, 27, 28, 33, 34, 35 and 44 under Section 112, second paragraph based on various antecedent basis issues. These claims have been amended to clarify the points raised by the examiner.

Claim 32 was rejected under Section 112, second paragraph based on applicants' description of the droplets as being atomized "to form particles sufficiently small to act as a gas." Applicants have amended claim 32 to now describe this step as "subjecting the liquid to ultrasonic waves to form an atomized liquid. The Examiner's rejection under Section 112 should be withdrawn.

As to claims 12-15 and 16-19, these claims were deemed allowable over the prior art once the Section 112 issues had been resolved. Applicants have amended claims 12 and 16 to include all of the limitations of original claim 11 making these claims as well as dependent claims 12-15 and 17-19 allowable.

Claim 36 was also deemed allowable once the Section 112 issues had been resolved. Applicants have amended claim 32 to include all of the limitations of claim 36 and original claim 36 has been canceled. The amendments to claim 32 make the claim allowable and the examiner's basis for rejecting original claim 32 is now moot. Claims 33-35 and 37-44 which depend from amended claim 32 are also now allowable.

As to the rejections based on prior art, the examiner rejected claims 11, 20, 22, 26, 27 and 29 under Section 102(b) based on the German reference DE 4,318,885. Additionally, claims 32, 33, 35 and 39 were rejected under either Section 102(b) or Section 103, also based on the German reference. In rejecting the claims on this reference, the examiner relied on what appears to be a translated abstract of the disclosure. Based on the above amendments and remarks, claims 11, 20, 22, 26, 27 and 29 stand rejected based on the German reference. However, based on applicants' understanding of the German reference, to the extent it discloses the treatment of hazardous material by coating the material, it discloses that such coating be done by a *spraying* process. Applicants have amended claim 11 to more clearly recite that their process requires the use of a *passive* aerosol. As set forth in the specification, a passive aerosol is preferred in that it is produced without creating

significant turbulence. Neither does it rely on the use of heat for its formation. Because it is passive in nature, the aerosol will be effective in areas where turbulence is to be avoided. (See specification, page 2, lines 21-37.) For example, in treating radioactive waste, it is best to encapsulate the hazardous particles in place without stirring the particles up. Moreover, it should be noted that applicants have expressly set forth the intended meaning of the term "aerosol." The term is defined as "a suspension of tiny droplets of liquid" that can be "made to behave like a gas," which are able "to flow from areas of high concentration to areas of low concentration," yet which "retain the chemical properties of a liquid." (Specification, page 3, lines 1-8.)

According to applicants understanding, the German reference, rather than disclosing the generation of such a "passive aerosol" discloses a *turbulent* suspension of liquid particles generated by a mechanical *spraying* apparatus. Therefore, claim 11, as amended, is distinguished over the art of record and is allowable. Claims 20-31 which depend from claim 11 are similarly allowable. However, applicants plan to have the entire German reference translated in order to confirm their understanding of its teaching and will supplement this response once the translation is available.

Claims 11-35 and 36-44 remain in this application. Applicants are of the opinion that all of the examiner's bases for rejecting certain of the claims have been overcome by this response, making all remaining claims allowable. Applicants request that the examiner promptly issue a Notice of Allowance.

If there are any remaining issues which can best be addressed by a telephone call, the examiner is asked to contact applicants' attorney at the number below.

Respectfully submitted,

CHRISTIE, PARKER & HALE, LLP

By David A. Plumley

David A. Plumley
Reg. No. 37,208
626/795-9900; 213/681-1800

DAP/ej

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High Stress

Most of the properties of piezoelectric ceramics vary with the level of applied mechanical stress or voltage. Data commonly are presented for piezoelectric ceramics at fairly low levels. Operating at high levels accelerates the aging process.

Curie Point

The Curie point is the absolute maximum exposure temperature for any piezoelectric ceramic. Each ceramic composition has its own Curie point. When the ceramic element is heated above the Curie point, all piezoelectric properties are lost. In practice, the operating temperature must be substantially below the Curie point. At elevated temperatures, the aging process accelerates, electrical losses increase, efficiency decreases, and the maximum safe stress level is reduced.

MORGAN MATROC PIEZOELECTRIC CERAMIC MATERIALS

Morgan Matroc manufactures several types of piezoelectric ceramic materials. Each type satisfies the requirements of a particular application group. By changing the chemical composition of the ceramic material, Morgan Matroc enhances specific properties, tailoring the material to the application. The ceramic materials are arranged in three groups: hard materials, soft materials, and custom materials.

High Power "Hard" Materials

High power or "hard" ceramics can withstand high levels of electrical excitation and mechanical stress. These materials are suited for high voltage or high power generators and transducers.

PZT-4 (DOD Type I)

This material is ideally suited for ultrasonic cleaning, sonar, and other high power acoustic radiation applications. PZT-4 is a lead zirconate titanate material capable of producing large mechanical drive amplitudes while maintaining low mechanical and dielectric losses. In addition, it can be used under both constant and repetitive conditions.

PZT-4D

This material is used in motor-type applications that require both high power levels and high sensitivity. PZT-4D is similar to PZT-4, but has a higher piezoelectric activity at the expense of a slight increase in mechanical and dielectric losses.

PZT-8 (DOD Type III)

This material is used in high power applications, even though its piezoelectric activity level is slightly lower than PZT-4. With an extremely high mechanical quality and extremely low loss factor, PZT-8 has the ultimate power handling capability.

High Sensitivity "Soft" Materials

High sensitivity or "soft" ceramics feature high sensitivity and permittivity, but under high drive conditions are susceptible to self heating beyond their operating temperature range. These materials are used in various pick-ups and sensors, low-power motor-type transducers, receivers, and low power generators.

PZT-5A (DOD Type II)

This material is used as the receiver or generator element in hydrophones, accelerometers, and vibration pickups. PZT-5A is a lead zirconate titanate with high sensitivity, permittivity, and time stability.

PZT-5B

This material is used in Bimorphs® and applications where greater motion is required. PZT-5B has higher sensitivity and piezoelectric activity than PZT-5A, with a slightly lower operation temperature requirement (lower Curie temperature).

PZT-5J (DOD Type V)

This material is used in fuses, hydrophones, and other applications that require a combination of high energy and high voltage output. PZT-5J is a lead zirconate titanate with a high permittivity and a high piezoelectric voltage constant.

PZT-5H (DOD Type VI)

This material is used in sensitive receivers and applications requiring fine movement control. It has been used in a wide range of applications from hydrophones to ink jet printers. PZT-5H provides extremely high permittivity, coupling, and piezoelectric constant. It has the lowest Curie temperature of the "soft" materials (or PZT-5 family) which restricts its operating temperature range. It has a lower time stability.

PZT-5R

This material is used in applications such as towed array lines. PZT-5R has high acoustic sensitivity, and high coupling, while maintaining a high permittivity.